

Atty. Docket No. OPP031050US
Serial No: 10/722,299

Support for the Amendments

Support for the present amendments can be found throughout the specification, claims and figures as originally filed. Without being limited to such exemplary passages and/or other disclosures, support for the amendments to claim 1 can be found in FIGS. 2-3 and in the specification on page 3, lines 28-30, and page 4, lines 3-22; support for new claim 18 can be found in the specification on page 4, lines 18-19 and in FIG. 3; support for new claim 19 can be found in the specification on page 3, lines 28-31; and support for new claim 20 can be found in the specification on page 3, lines 28-31 and page 4, lines 26-29. Support for the amendments to the remaining claims can be found in the context of the claims as originally filed. Support for the amendments to the specification can be found in the context of paragraph [0020] of the specification and FIGS. 2-3 as originally filed. Thus, no new matter is introduced by the present Amendment.

Remarks

Applicant thanks Examiner Berezny for the courteous and helpful discussion held with the undersigned practitioner on February 7, 2005. The Examiner's concerns have been given serious consideration, and the above amendments have been made in accordance therewith. The following remarks shall further summarize and expand upon topics discussed.

The present invention relates to a method for fabricating a metal line of a semiconductor device. The method as set forth in amended Claim 1 above generally forms a plurality of metal lines such that a dimension between adjacent metal lines is less than the width of an opening in a photoresist pattern formed on the metal layer. This result is neither disclosed nor suggested by the cited references.

The Objection to the Specification

The objection to the specification has been obviated by appropriate amendment.

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The Rejections of the Claims under 35 U.S.C. § 103(a)

The rejections of Claims 1-3 and 11-17, and separately, of Claims 4-10 under 35 U.S.C. § 103(a) as being unpatentable over Narita et al. and Hart et al. are respectfully traversed.

Narita et al. disclose a dry etching method for use in patterning stacked metal films containing aluminum as the base component and a thin film including at least one of titanium and titanium nitride. In this method, the thin film is dry-etched using a first etching gas composition for preventing the metal film from being processed. The metal film is then dry-etched using a second etching gas composition other than the first etching gas (Abstract).

The method of Narita et al. intends to provide a dry etching method capable of patterning a stacked film such that the thin film is formed vertically and the metal film is prevented from being side-etched (col. 2, ll. 47-53) and/or reduce a pattern transfer difference in a stacked film (col. 3, ll. 1-4). As the Examiner correctly recognizes, Narita et al. do not disclose forming a buffer layer as claimed (see, e.g., page 3, lines 6-7 of the Office Action). However, Hart et al. fail to cure the deficiencies of Narita et al. with regard to the result now recited in the present claim 1 (forming metal lines such that a dimension between adjacent metal lines is less than the width of the opening in overlying photoresist).

For example, Hart et al. disclose an improved method for grit blasting slots in a silicon wafer, including providing a silicon wafer, applying a non-water soluble layer to a surface of the wafer to provide a first substantially permanent layer thereon, applying a water-soluble protective material to the first layer to provide a second layer, grit blasting slots in the wafer corresponding to the individual semiconductor components, and subsequently, removing the water-soluble protective layer from the wafer. The protective layer provides enhanced protection for the electrical components on a silicon wafer during grit blasting so that a higher yield of useable semiconductor chips may be made (see, e.g., the Abstract).

However, Hart et al. is silent with regard to dry etching a metal layer, much less doing so at a lower side of an opening in an overlying photoresist layer. As a result, Hart et al. cannot

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possibly suggest forming metal lines such that a dimension between adjacent metal lines is less than the width of that opening (see amended Claim 1). Consequently, Hart et al. do not cure the deficiencies of Narita et al. with regard to the result recited in the present claim 1, and claim 1 is believed to be fully patentable over Narita et al. and Hart et al.

Claims 2-20 all depend directly or indirectly from claim 1, and are therefore believed to be patentable for the same reasons as claim 1. Thus, this ground of rejection is unsustainable, and should be withdrawn.

Conclusions

In view of the above amendments and remarks, all bases for objection and rejection are believed to be overcome, and the application is believed to be in condition for allowance. Early notice to that effect is earnestly requested.

If it is deemed helpful or beneficial to the efficient prosecution of the present application, the Examiner is invited to contact Applicant's undersigned representative by telephone.

Respectfully submitted,



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